

CERTIFICATION

I, Takao Kohno; 4-3, Tsuriganecho 2-chome, Chuo-ku, Osaka
540, Japan, hereby certify that I am the translator of the
documents in respect of an application for a patent filed in
Japan on the 5th day of August, 1996
(Japanese Patent Application No. 8-206223)

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KOHNO PATENT OFFICE



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[Name of the Document] Specification

[Title of the Invention] Internet Television

[Claims for Patent]

[Claim 1] An Internet television capable of: displaying a picture signal in a video signal on a screen and taking in data from a computer connected to the Internet via a telephone line, converting it into a picture signal and display it on a screen; and switching from a picture signal relating to the Internet which is displayed on said screen to a picture signal in said video signal during the period when the television is in a state of waiting for connection to the computer and/or in the process of connection to the computer via the telephone line, characterized by comprising first clocking means for clocking the time from connection to the computer via the telephone line and time displaying means for displaying the time clocked by the first clocking means on the screen.

[Claim 2] An Internet television as set forth in claim 1, wherein the connection of the telephone line is cut off when operation relating to the Internet is not done until the first clocking means clocks a predetermined time.

[Claim 3] An Internet television as set forth in claim 1 or claim 2, further comprising second clocking means for starting clocking every time an operation relating to the Internet is done, wherein the connection of said telephone line is cut off when an

operation relating to the Internet is not done until the second clocking means clocks a predetermined time.

[Claim 4] An Internet television as set forth in claim 2 or claim 3, wherein a notice of disconnection of said telephone line is displayed on the screen for a predetermined time before cutting off the connection of the telephone line.

[Claim 5] An Internet television for: displaying a first picture signal in a video signal on a screen; and taking in data from the Internet via a telephone line, converting it into a second picture signal and displaying it on the screen; and compressing the first picture signal and the second picture signal respectively in a horizontal direction of the screen in synchronism with the synchronizing signal in said video signal; composing the signals laterally; and displaying them on the screen, comprising: detecting means for detecting presence or absence of said synchronizing signal while said composing means is composing the first and second signals laterally and displaying them on the screen; and displaying means for displaying the second picture signal on the entire screen while said detecting means has not detected the synchronizing signal.

[Claim 6] An Internet television as set forth in claim 5, wherein it is displayed on the screen that said video signal is not received when said displaying means displays the second picture signal on the entire screen.

[Detailed Description of the Invention]

[0001]

[Field of Industrial Application]

The present invention relates to an Internet television for displaying a picture signal in a video signal on a screen, and taking in data from the Internet via a telephone line, converting it into a picture signal and displaying it on the screen.

[0002]

[Prior Art]

The Internet is a network of multiple computers connected on a global scale, and various pieces of readable information are stored in individual computers. These pieces of information include E-mails, various programs, and home pages, which can be communicated in two ways. The home page corresponds to the title and table of contents of a piece of information, and by selecting a graphic pattern (icon) or a word on the home page, the necessary information can be retrieved.

[0003]

FIG. 19 is an explanatory diagram for explaining an example of connection between each computer and the Internet. In this example, a personal computer 7 is connected to a telephone line 2 via a modem 8 or a terminal adapter, and via the telephone line 2, it is further connected to a modem 3 or a terminal adapter of a provider which is a connection service firm. The modem 3 is connected to a

server 4 which is the computer of the provider.

[0004]

The server 4 is connected to the Internet 6 around the clock, and is connected to the Internet 6 through a router 5 for setting a trunk route.

From the personal computer 7, a telephone call is made when necessary, and a connection is made to the Internet 6 through the server 4 of the provider (dial-up connection).

Lately, an Internet television is proposed, which is used in the place of a personal computer 7 to be connected to the Internet 6 and display various Internet information on its screen.

[0005]

[Problems to be Solved by the Invention]

The applicant has proposed in this application an Internet television capable of displaying a television program on a screen while it is connected to the Internet via a telephone line, and an Internet television capable of displaying a television program and Internet screen at the same time.

[0006]

When the television program is displayed on the screen with the telephone line connected to the Internet, the user may forget that the telephone line is connected to the Internet, or even when the screen relating to the Internet is displayed, a user could forget that

the telephone line is connected to the Internet, and the telephone charge is increased in vain.

If the television broadcast is terminated while displaying the television broadcast and the Internet screen simultaneously, it is preferred that the Internet screen may be shown in the entire display area.

[0007]

The invention is devised in the light of the above problems, and it is hence the object of the first through fourth inventions to present an Internet television preventing waste of telephone charge by forgetting about the connection of telephone line with the Internet.

According to the fifth and sixth inventions, the object of the invention is to present an Internet television capable of displaying the Internet screen on the entire display screen automatically when the television program is terminated while displaying the television program and Internet screen simultaneously.

[0008]

[Means for Solving the Problems]

The Internet television according to the first invention of the present invention is an Internet television capable of displaying a picture signal in a video signal on a screen and taking in data from a computer connected to the Internet via a telephone line, converting it into a picture signal and display it on a screen, and

also capable of switching from a picture signal relating to the Internet which is displayed on said screen to a picture signal in said video signal during the period when the television is in a state of waiting for connection to the computer and/or is in the process of connection to the computer via the telephone line, characterized by comprising first clocking means for clocking the time from connection to the computer via the telephone line and time displaying means for displaying the time clocked by the first clocking means on the screen.

[0009]

According to this Internet television, the first clocking means clocks the time from connection to the computer via the telephone line. And the first displaying means displays the time clocked by the first clocking means irrespective of the picture signal being displayed on the screen, that is, if it is a picture signal relating to the Internet or a picture signal in a video signal.

This prevents the user from wasting telephone charge by forgetting about the connection of the telephone line to the Internet.

[0010]

An Internet television according to the second invention is characterized by that the connection of the telephone line is cut off when an operation relating to the Internet is not done until the first clocking means clocks a predetermined time.

[0011]

According to this Internet television, the connection of the telephone line is cut off when an operation relating to the Internet is not done until the first clocking means for clocking the time from connection of the television with the computer via a telephone line clocks a predetermined time.

This prevents a waste of telephone charge, even if the user forgets about the connection of the telephone line to the Internet.

[0012]

An Internet television according to the third invention is characterized by comprising second clocking means for starting clocking every time an operation relating to the Internet is done, wherein the connection of the telephone line is cut off when an operation relating to the Internet is not done until the second clocking means clocks a predetermined time.

[0013]

According to this Internet television of the third invention, the second clocking means starts clocking every time an operation relating to the Internet is done, and the connection of the telephone line is cut off when an operation relating to the Internet is not done until the second clocking means clocks a predetermined time.

This prevents a waste of telephone charge, even if the user forgets about the connection of the telephone line to the Internet.

[0014]

An Internet television according to the fourth invention is characterized by that a notice of disconnection of said communication line is displayed on the screen for a predetermined time before cutting off the connection of the telephone line.

[0015]

According to this Internet television, the first clocking means or the second clocking means clocks the predetermined time, and a notice of disconnection of said telephone line is displayed on the screen for a predetermined time before cutting off the connection of the telephone line.

This prevents a wast of telephone charge, even if the user forgets about the connection of the telephone line to the Internet, since the user is reminded of it.

[0016]

An Internet television according to the fifth invention is an Internet television for displaying a first picture signal in a video signal on a screen and taking in data from the Internet via a telephone line, converting it into a second picture signal and displaying it on the screen, and compressing the first picture signal and the second picture signal respectively in a horizontal direction of the screen in synchronism with the synchronizing signal in said video signal, composing the signals laterally, and displaying them on the screen, characterized by comprising: detecting means for

detecting presence or absence of said synchronizing signal while said composing means is composing the first and second signals laterally and displaying them on the screen; and displaying means for displaying the second picture signal on the entire screen of the displaying means while said detecting means has not detected the synchronizing signal.

[0017]

According to this Internet television, the detecting means detects presence or absence of said synchronizing signal when the first picture signal and the second picture signal are composed laterally and displayed on the screen, and the displaying means displays the second picture signal on the entire screen of the displaying means when said detecting means has not detected the synchronizing signal.

This permits the Internet screen to be shown in the entire display area when the television program is terminated in the state where the television broadcast and the Internet screen are displayed at the same time.

[0018]

An Internet television according to the sixth invention is characterized by that a notice is displayed on the screen to indicate that the video signal is not received when said displaying means displays the second picture signal on the entire screen.

This permits the Internet screen to be shown in the entire display area when the television program is terminated in the state where the television broadcast and the Internet screen are displayed at the same time, and the user can be reminded of the termination of the program.

[0019]

[Embodiments of the Invention]

Referring now to the drawings, embodiments of the invention are described below.

FIG. 1 is an explanatory diagram showing a connection example of an Internet television as an embodiment of an Internet information displaying apparatus of the invention and the Internet. In this connection example, an Internet television 1 remote controlled by a remote controller 20a is connected to a telephone line 2. A modem is built in the Internet television 1. The telephone line 2 is connected to a modem 3 or terminal adapter of a provider as a connection service firm, and the modem 3 is connected to a server 4 which is the provider's computer.

[0020]

The server 4 is connected to the Internet 6 around the clock, and is connected to the Internet 6 through a router 6 for setting the trunk route.

From the Internet television 1, when the remote controller

20a is operated, the telephone is called automatically to connect to the Internet 6 through the server 4 of the provider (dial-up connection).

[0021]

FIG. 2 is a block diagram showing an essential constitution of an embodiment of the Internet television of the invention (the sound system is omitted from the drawing). In this Internet television 1, the television wave received by an antenna 10a is selected by a tuner 10, and the selected television wave is sent into a video intermediate frequency detector 11, in which the video signal is detected. The detected video signal is sent into a video chroma processing unit 12, in which luminance signal Y and color difference signals B-Y, R-Y are extracted.

[0022]

The extracted luminance signal Y and color difference signals B-Y, R-Y are sent into a video chroma processing unit 13, and converted into red, green and blue color signals R, G, B. These color signals R, G, B are applied to an RGB matrix 15 through a switching unit 14, and outputted to a CRT 17 in each color.

The video signal detected by the video intermediate frequency detector 11 is also given to a synchronizing separation and deflection processing unit 16, and a vertical synchronizing signal and a horizontal synchronizing signal are extracted. The extracted vertical

synchronizing signal and horizontal synchronizing signal are given to the CRT 17, and are used as the synchronizing signal for screen scanning.

[0023]

The color signals R, G, B converted by the video chroma processing unit 13 are also given to a TV picture horizontal compression unit 18 through the switching unit 14. The TV picture horizontal compression unit 18 has a line memory for storing the picture signal of every scanning line, and generates a write clock of $4fsc$ (fsc = frequency of subcarrier of color) at a multiple frequency of the horizontal synchronizing signal given from the synchronizing separation and deflection processing unit 16, and a picture signal is written in. When reading out the picture signal, a read clock at double frequency $8fsc$ of the write clock is generated, and is given to a picture right and left composing unit 19.

[0024]

On the other hand, an Internet processing unit 22 connected to a communication line 24 extracts red, green and blue color signals R, G, B of the picture signal from the data given through the communication line 24, and these color signals R, G, B are given to an RGB matrix 15 through a switching unit 23, and outputted to the CRT 17 in each color. The Internet processing unit 22, when displaying the Internet screen only, generates a vertical synchronizing signal and a

horizontal synchronizing signal independently, and these vertical synchronizing signal and horizontal synchronizing signal are given to the CRT 17 and used as the synchronizing signal for screen scanning.

[0025]

When instructed from the remote controller 20a, the Internet processing unit 22 writes in the picture signal by making a direct memory access (DMA) at the timing generated on the basis of the horizontal synchronizing signal and vertical synchronizing signal given from the TV picture horizontal compression unit 18, reads it out by the read clock at frequency of 8fsc locked in line to the horizontal synchronizing signal, and gives it to the picture right and left composing unit 19 through the switching unit 23.

The color signals R, G, B outputted from the Internet processing unit 22 are also given to the picture right and left composing unit 19 through the switching unit 23.

The picture right and left composing unit 19 composes the picture signals given from the TV picture horizontal compression unit 18 and Internet processing unit 22 in the horizontal direction, and the composed video signal is given to the RGB matrix 15, and outputted to the CRT 17 in each color.

[0026]

The channel selection microcomputer 20 outputs a channel selection instruction signal to the tuner 10 according to the

instruction by the light signal, radio wave signal or the like from the remote controller 20a, and exchanges signals with the Internet processing unit 22, thereby operating and controlling the Internet television 1. If necessary, moreover, an instruction signal is also given to an on-screen display controlling unit 21, and the picture signal from the on-screen display controlling unit 21 is given to the RGB matrix 15.

The channel selection microcomputer 20 also outputs a changeover signal of the mode for displaying the Internet screen in the entire display screen area, and the mode for displaying the television program and Internet screen simultaneously to the switching unites 14 and 23.

[0027]

FIG. 3 is a block diagram showing a constitution of the Internet processing unit 22. In this Internet processing unit 22, a modem 41 connected to the communication line 24 is connected to a CPU 38, and the CPU 38 is connected to a RAM 37, a ROM 39, and a gate array 36 through a bus 40.

The RAM 37 stores picture signal of data obtained through the modem 41 and others, and the ROM 39 stores the processing program of the Internet processing unit 22, picture signal of the original screen (menu screen, etc.) of the Internet television 1, and others.

[0028]

A synchronizing signal generator 25 generates the original vertical synchronizing signal and horizontal synchronizing signal of the Internet processing unit 22 on the basis of the clock outputted from a clock generator 26, and gives them to the gate array 36. The clock generator 26 generates a clock of 8fsc, and gives it to the gate array 36.

[0029]

The gate array 36 includes a video FIFO 29 which is a line memory, a write controller 27, and read controller 28. The write controller 27 receives the vertical synchronizing signal and horizontal synchronizing signal from the TV picture horizontal compression unit 18 or synchronizing signal generator 25, and also receives a write clock from the TV picture horizontal compression unit 18 or clock generator 26, and controls the writing of the video FIFO 29. The read controller 28 receives the vertical synchronizing signal and horizontal synchronizing signal from the TV picture horizontal compression unit 18 or synchronizing signal generator 25, and also receives the read clock from the TV picture horizontal compression unit 18 or clock generator 26, and controls the reading of the video FIFO 29.

[0030]

The gate array 36 further includes an I/O port (1) 31 for exchanging signals with the channel selection microcomputer 20, an

interrupt controller 30 for outputting a signal from this I/O port (1) 31 and vertical synchronizing signal as an interrupt signal of the CPU 38, and an I/O port (2) 32 for exchanging signals with an EEPROM 33 for storing telephone number, ID, password, communication log, etc.

[0031]

In the case of one-screen display, the synchronizing signal generator 25 outputs whether the next display field is odd or even.

In the case of two-screen display, the read controller 28 judges whether the next display field is odd or even from the relation of the given vertical synchronizing signal and horizontal synchronizing signal, and gives the result of judgement to the CPU 38 through the interrupt controller 30 at the interrupt timing of the vertical synchronizing signal.

The color signals R, G, B being read out from the video FIFO 29 are individually tinted finely in a color palette 35, and outputted to the switching unit 23.

[0032]

FIG. 4 is a block diagram showing the constitution of the channel selection microcomputer 20. In this channel selection Microcomputer 20, a communication controller 56, an I/O port 55, a RAM 54, and a ROM 53 are connected through a bus 51 to a CPU 50 to which a first timer 52 as first clocking means and a second time 57 as second clocking means are connected.

The communication controller 56 communicates with the remote controller 20a. The I/O port 55 is connected individually to the tuner 10, OSD controlling unit 21, Internet processing unit 22, etc.

[0033]

Now an explanation will be given about the operation of the Internet television 1 with the above constitution.

In the Internet television 1, when a mode for operating as an ordinary television is selected by the channel selection microcomputer 20, the television wave received by the antenna 10a is selected by the tuner 10 by the instruction from the channel selection microcomputer 20. The selected television wave is sent to the video intermediate frequency detector 11, and a video signal is detected, and from the detected video signal, luminance signal Y and color difference signals B-Y, R-Y are extracted by the video chroma processing unit 12.

[0034]

The extracted luminance signal Y and color difference signals B-Y, R-Y are sent to a video chroma processing unit 13, and converted into red, green and blue color signals R, G, B. These color signals R, G, B are applied to an RGB matrix 15 through the switching unit 14, and outputted to the CRT 17 in each color.

From the video signal detected by the video intermediate frequency detector 11, a vertical synchronizing signal and a horizontal synchronizing signal are extracted by the synchronizing

separation and deflection processing unit 16. The extracted vertical synchronizing signal and horizontal synchronizing signal are given to the CRT 17, and are used as the synchronizing signal for scanning.

[0035]

In the Internet television 1, when a mode for operating as Internet television is predetermined by the channel selection Microcomputer 20, the CPU 38 is interrupted by the interrupt controller 30. When interrupted, the CPU 38 reads out the picture signal for the portion of one screen of the menu screen from the ROM 39, and sets it into the RAM 37. The clock generator 26 outputs a clock, and sends it into the write controller 27 and read controller 28.

The channel selection microcomputer 20 outputs a changeover signal, and stops the output from the switching unit 14, and changes over the input to the RGB matrix 15 to the data from the switching unit 23 and on-screen display controlling unit 21 only.

[0036]

The interrupt controller 30 starts up the DMA controller 38a incorporated in the CPU 38 every time a horizontal synchronizing signal is given from the read controller 28, causes the DMA to read out color signals R, G, B of video signal for the portion of one scanning line from the RAM 37, and gives them to the video FIFO 29. In the video FIFO 29, these color signals R, G, B are written in by the write controller 27 by the write clock of 8fsc, and read out by the

timing generated by the read controller 28, and the color signals R, G, B being read out are given to the RGB matrix 15 through the switching unit 23, and are outputted to the CRT 17 in every color.

[0037]

In the case of one-screen display, the synchronizing signal generator 25 gives the vertical synchronizing signal and horizontal synchronizing signal to the CRT 17, and they are used as the synchronizing signal when scanning the color signals R, G, B on the screen.

[0038]

At this time, the DMA controller 38a, as shown in FIG. 23, reads out color signals R, G, B of picture signal from the RAM 37, from one line before start of display on the display screen of the CRT 17 (upper right corner in FIG. 23) by DMA, and terminates writing into the video FIFO 29 during the period of invalid display region B (horizontal fly-back period) not displayed in the display screen of the CRT 17, and during the period of valid display region A displayed in the display screen of the CRT 17, the read controller 28 reads out from the video FIFO 29.

[0039]

The synchronizing signal generator 25 gives the output showing whether the next display field is odd or even to the CPU 38 by interrupt processing at the interrupt timing of the vertical

synchronizing signal. The CPU 38, according to the result, sets the address of the RAM 37 of the picture signal to be read out to the DMA controller 38a.

[0040]

As a result of the above operation, the menu screen as shown in FIG. 9 appears on the display screen of the CRT 17. Among the pictures (icons) of "shop information", "travel and sightseeing", "news", "education", "amusement", "local and enterprise information", "original", "search", and "E-mail" of the menu screen, when the user selects and determines the icon of, for example, "travel and sightseeing" by operating the remote controller 20a, the Internet processing unit 22 displays the selection screen of "travel and sightseeing" as shown in FIG. 10 same as mentioned above. Similarly, thereafter, every time selection is decided on the selection screen, the lower selection screen is similarly displayed consecutively like a tree.

[0041]

The remote controller 20a has a selection button (43) at the right end of the upper portion of the screen, a decision button (44) at the left end, and various sorts of operation buttons (45) at the center thereof, as a picture 42 displayed in a lower portion of the initial screen (FIG. 6). The selection button is capable of moving the position of an "index" pointer or a cursor freely in eight

directions. A picture on which the pointer or the cursor is positioned when the decision button is operated (including a picture of a button) or an item displayed as a character string is selected and determined.

[0042]

When the selection is determined and search is advanced on the selection screens, the icons relating to the searched items are read out from the ROM 39 and EEPROM 33 and displayed in the display screen. When the user operates the remote controller 20a and selects and determines from the icons, the CPU 38 reads out the telephone number of the server 4 of the provider from the EEPROM 33, and dials the telephone, and the provider's server 4 and Internet processing unit 22 are connected. When connected to the provider's server 4, the URL corresponding to the selected and decided icon is called and connected.

[0043]

When the data of the home page of the connected URL is sent forth through the communication line 24 and modem 41, the CPU 38 converts the data into the picture signal, and sets in the RAM 37. The picture signal set in the RAM 37 is displayed in the display screen same as in the case of the menu screen.

When calling the URL not registered, the "URL input" of the menu screen of the browser mentioned below is selected and decided,

and the URL is inputted.

While calling the telephone and URL, the display "Now in the process of connection" as shown in FIG. 13(a) or "Line connection." and "Searching address" as shown in FIG. 13(b) appears at the bottom of the basic pattern in which the browser menu screen as shown in FIG. 14(a) is displayed at the top.

[0044]

Herein, when the menu screen (FIG. 6) is displayed, for example, if the mode for showing the ordinary television program and Internet screen at the same time is designated by the channel selection microcomputer 20, the CPU 38 is interrupted by the interrupt controller 30.

The channel selection microcomputer 20 outputs a changeover signal at this time, and changes over the output from the switching unit 14 and the output from the switching unit 23 to the TV picture horizontal compression unit 18.

[0045]

In the Internet television 1, the color signals R, G, B converted into red, green and blue color signals R, G, B by the video chroma processing unit 13 are given to the TV picture horizontal compression unit 18 through the switching unit 14.

The TV picture horizontal compression unit 18 generates a write clock of 4fsc at multiple frequency of the horizontal

synchronizing signal given from the synchronizing separation and deflection processing unit 16, and writes in the color signals R, G, B of the picture signal by using it. When reading out the color signals R, G, B of the picture signal, a read clock of double frequency 8fsc of the write clock is generated, and the color signals R, G, B are read out from the start end of the scanning line by using it, and given to the picture right and left composing unit 19.

[0046]

On the other hand, the Internet processing unit 22 reads out the picture signal for the portion of one screen of the menu screen from the ROM 39, when the CPU 38 is interrupted as the mode for displaying the ordinary television program and Internet screen at the same time is designated, sets in the RAM 37, and stops the synchronizing signal generator 25 and clock generator 26.

The Internet processing unit 22 is then given with the vertical synchronizing signal, horizontal synchronizing signal, and clock of 8fsc from the TV picture horizontal compression unit 18.

[0047]

The interrupt controller 30, every time a horizontal synchronizing signal is given from the read controller 28, starts the DMA controller 38a incorporated in the CPU 38, reads out the color signals R, G, B of picture signal for the portion of one scanning line from the RAM 37 to give to the video FIFO 29 by DMA. In the video

FIFO 29, the color signals R, G, B are written in at the timing generated by the write controller 27, and the read controller 28 reads out the picture signal from the timing of the middle point of the scanning line by the read clock of 8fsc, and the color signals R, G, B being read out are given to the picture right and left composing unit 19 through the switching unit 23.

[0048]

The picture right and left composing unit 19 composes the picture signals given from the TV picture horizontal compression unit 18 and Internet processing unit 22 in the horizontal direction, and the composed picture signal is given to the RGB matrix 15, and outputted to the CRT 17 in every color. As a result, as shown in FIG. 12, the ordinary television program is shown in the left half of the display screen, and the Internet screen in the right half. This is not limited to the menu screen of the Internet, but is applicable in any screen of the Internet.

[0049]

FIG. 12 is a flowchart showing the operation of the CPU 38 when the television broadcast is terminated in the mode of displaying the ordinary television program and Internet screen at the same time. When the vertical synchronizing signal and horizontal synchronizing signal are not given from the read controller 28, the interrupt controller 30 judges that the television broadcast is terminated, and

notices it to the CPU 38 by interrupt (S64). By this notice, the CPU 38 actuates the clock generator 26 and synchronizing signal generator 25 (S66, S68), and gives the vertical synchronizing signal, horizontal synchronizing signal, and clock to the write controller 27 and read controller 28.

[0050]

Next, the CPU 38 notices it to the channel selection microcomputer 20, and causes the channel selection Microcomputer 20 to output a changeover signal to stop the output from the switching unit 14, and the output from the switching unit 23 is outputted to the RGB matrix 15, so that the Internet screen is displayed in the entire display screen area (S70).

Consequently, the CPU 38 causes the channel selection microcomputer 20 to display a warning (caution) such as "TV broadcast is over" at the lower end of the screen showing the Internet information as shown in FIG. 14(a) through the on-screen display controlling unit 21 (S72). (In this case, however, the Internet screen is displayed instead of the TV screen.)

The other operations of the Internet television 1 are same as in the mode of operating as an ordinary televisions mentioned above and the mode of displaying the Internet screen in the full display screen, and the explanations are omitted.

[0051]

FIGS. 9 through 11 are flowcharts showing the operation about the display screen of the CPU 38 and CPU 50 of channel selection microcomputer 20 from the moment of operation of the Internet button. The operation about the display screen of the CPU 38, CPU 50 is described below by referring to these flowcharts.

The CPU 50 outputs a changeover signal to the switching unites 14, 23 when the Internet button of the remote controller 20a is operated (S10), and starts screen display from the Internet processing unit 22 (S12).

[0052]

When the URL is selected and determined or entered, and the connection operation of the communication line 24 starts (S14), when the screen changeover mode during connection operation is set in the automatic mode in the channel selection CPU 20 (S16), the CPU 50 operates the switching unites 14, 23, and starts screen display of the television program (S18).

[0053]

When the connection of the communication line 24 is complete (S20), the CPU 50 resets and starts the first timer 52, and the time clocked by the first timer 52 is displayed on the screen in the unit of, for example, 1 minute through the On-screen display controlling unit 21 (S21).

When the data of the home page of the called URL is sent

through the communication line 24 and modem 41, the CPU 38 converts the data into picture signal, and sets in the RAM 37. The image signal set in the RAM 37 is displayed in the display screen same as in the case of menu screen (S22).

[0054]

When the screen changeover mode during connection operation is set in the manual mode in the channel selection microcomputer 20 (S16), the CPU 50 displays "Connecting to the provider" as shown in FIG. 13(a) or "Line connection" and "Searching address" as shown in FIG. 13(b) through the on-screen display controlling unit 21 at the lower end of the basic pattern in which the browser menu screen as shown in FIG. 14 is displayed at the upper end (S30). In this state, when the connection of the communication line 24 is complete (S31), the CPU 50 resets and starts the first timer 52, and the time clocked by the first timer 52 is displayed on the screen in the unit of, for example, 1 minute through the on-screen display controlling unit 21 (S33).

[0055]

In this state, when the remote controller 20a is operated, and the screen changeover is instructed (S32), the CPU 50 operates the switching unites 14, 23, and starts screen display of television program (S34). In this state, when the connection of the communication line 24 is complete (S35) (if connection is already

complete, connection is not complete at this point, as a matter of course), the CPU 50 resets and starts the first timer 52, and the time clocked by the first timer 52 is displayed on the screen in the unit of, for example, 1 minute through the on-screen display controlling unit 21 (S37).

Consequently, the CPU 50 displays "Connection is completed" same as shown in FIG. 13 at the lower end of the screen of the television program through the on-screen display controlling unit 21 (S37a).

[0056]

At the same time, the CPU 50 resets and starts the second timer 57 (S39). After starting the second timer 57 (S39), upon lapse of a predetermined time (for example, 6 minutes) (S41), the warning of "Now cutting off the line" as shown in FIG. 13 is displayed for 1 minute, for example, at the lower end of the screen of the television program through the on-screen display controlling unit 21 (S43). In this period of 1 minute, the remote controller 20a is operated, and when the screen changeover is instructed (S51), the CPU 50 operates the switching unites 14, 23, and starts display of the screen about the Internet (S22).

When the screen changeover is not instructed (S51), the CPU 38 cuts off the communication line 24 (S42), and displays the television program successively, or starts display of television

program (S44).

[0057]

After starting the second timer 57 (S39), until a specific time (for example, 6 minutes) passes (S41), when the remote controller 20a is operated and the screen changeover is instructed (S36), the CPU 50 operates the switching unites 14, 23, and starts the display of screen about the Internet (S38).

When the screen changeover is not instructed (S32), the CPU 50 continues to display the screen about the Internet, and waits for next instruction.

[0058]

When the connection of the communication line 24 is not complete (S35), and the remote controller 20a is operated to instruct the screen changeover (S36), the CPU 50 operates the switching unites 14, 23, and starts display of the screen about the Internet (S38). At this time, the display "Connecting to the provider" or "Line connection" or "Searching address" is shown through the screen display 21 (S38).

In this state, when the connection of the communication line 24 is complete (S45), (if connection is already complete, connection is not complete at this point, as a matter of course), the CPU 50 resets and starts the first timer 52, and the time clocked by the first timer 52 is displayed on the screen in the unit of, for example,

1 minute through the on-screen display controlling unit 21 (S47).

[0059]

In the state of the screen display from the Internet processing unit 22 (S22, S38), when the remote controller 20a is operated and the screen changeover is instructed (S24), the CPU 50 operates the switching unites 14, 23, and starts the screen display of the television program (S26).

At the same time, the CPU 50 resets and starts the second timer 57 (S23). After starting the second timer 57 (S23), upon lapse of a predetermined time (for example, 6 minutes) (S25), the warning of "Now cutting off the line" as shown in FIG. 29 is displayed for 1 minute, for example, at the lower end of the screen of the television program through the On-screen display controlling unit 21 (S27).

[0060]

In this period of 1 minute, the remote controller 20a is operated, and when the screen changeover is instructed (S29), the CPU 50 operates the switching unites 14, 23, and starts display of the screen about the Internet (S22).

When the screen changeover is not instructed (S29), the CPU 38 cuts off the communication line 24 (S42), and displays the television program successively, or starts display of television program (S44).

[0061]

After starting the second timer 57 (S23), until a predetermined time (for example, 6 minutes) passes (S25), when the remote controller 20a is operated and the screen changeover is instructed (S28), the CPU 50 operates the switching unites 14, 23, and starts the display of screen about the Internet (S22).

[0062]

In the state of screen display from the Internet processing unit 22 (S22, S38), when the Internet button of the remote controller 20a is operated (S40), the CPU 38 cuts off the communication line 24 (S42), and the CPU 50 operates the switching unites 14, 23, and starts the screen display of the television program (S44).

[0063]

The CPU 38 and CPU 50, when the screen is displayed from the Internet processing unit 22, make the following operation aside from the operation mentioned above.

The CPU 50, when the connection of the communication line 24 is complete (S50) while the screen from the Internet processing unit 22 is displayed, resets and starts the second timer 57 (S52), and, until the second timer 57 clocks, for example, 6 minutes (S54), if the Internet button is operated (S56), it resets and starts the second timer 57 again (S52), and starts clocking of 6 minutes (S54).

[0064]

Until the second timer 57 clocks 6 minutes (S54), if the

button relating to the Internet is not operated (S54), the CPU 50 displays the warning "Now cutting off the line" same as shown in FIG. 13, for 1 minute, for example, at the lower end of the screen relating to the Internet through the on-screen display controlling unit 21 (S58). In this period of 1 minute, when the remote controller 20a is operated and the screen changeover is instructed (S59), the CPU 50 resets and starts the second timer 57 again (S52), and starts clocking of 6 minutes (S54).

When the screen changeover is not instructed (S59), the CPU 38 cuts off the communication line 24 (S60), and the CPU 50 operates the switching unites 14, 23, and starts screen display of the television program (S62).

[0065]

FIG. 14(a) is an explanatory diagram of a menu screen of the browser which is displayed in the upper end portion of the display screen upon necessity when the Internet screen is displayed. This menu screen display buttons having the icons representing, sequentially from the left end, "Return", "Advance", "Read again", "Read image again", "URL input", "URL register", "Stop", "End", "Move down", "Move up", "Move left", and "Move right".

[0066]

By operating the selection button 43 of the remote controller 20a and moving the pointer 46 to any of the buttons (S202), as shown

in FIG. 14(b), the button is extended widely in the lower direction (S203), showing that the button is being selected. However, the buttons for "Move down", "Move up", "Move left", and "Move right" are not extended widely in the lower direction.

Once the button is selected and determined, to jump to other screen, the pointer 46 shown in FIG. 14(b) is changed to the "index" pointer 48.

[0067]

In the state of the button extended widely in the lower direction and selected (NO in S204), when the decision button 44 is operated (clicked) (S205), the button is once depressed as shown in FIG. 15(a), and the button becomes a darker color than usually, and the shadow and highlight are reversed (S206). As a result, the selection and determination of the button are displayed.

When the button is not related to any action, by moving the pointer 46 to the button (YES in S204), as shown in FIG. 15(b), the pointer 46 is not changed, and the dark and bright parts of the icon of the button are once reversed to urge caution.

[0068]

FIG. 16 is other explanatory diagram of the browser menu screen. In this menu screen, when the button is selected and determined, a large button relating to that button is displayed together with the panel 47. At this time, the key cursor moves only

on the large button by the operation of the selection button 43, and when the key cursor moves onto the button, the button becomes bright to display that the button is selected (panel 47). In this state, when the decision button 44 is operated, the button is once depressed, showing that the button is selected and determined (panel 47a).

[0069]

FIG. 17 and FIG. 18 are explanatory diagrams of character palette. The character palette is displayed by selecting and determining the character input button when character input is necessary in the case of URL input and making an E-mail. In the character palette, buttons are assigned for every character, symbol and operation item. FIG. 17 shows a character palette of alphanumerics and capitals, and FIG. 18 shows a character palette of transfer of Chinese characters, and moreover character palettes for alphanumerics and lower cases, hiragana, and others are displayed by selecting and determining the operation item button as required.

[0070]

The pointer is preliminarily moved to the position where character input is necessary, the decision button 44 is operated, and the cursor display is changed within the screen frame where character input is necessary. In this state, when the character input button is selected and determined, the character palette is displayed, and the index pointer is moved onto the button by the operation of the

selection button 43, and the decision button 44 is operated, and then the button is once depressed and the color becomes dark for a moment, showing that the button is selected and determined. The character corresponding to the button selected and determined is displayed in the input display area 49, and the character input is entered into the required screen frame.

[0071]

[Advantages of the Invention]

According to the Internet television of the first invention of the present invention, a waste of telephone charge can be prevented because the user can not forget about the connection of the telephone line to the Internet.

[0072]

According to the Internet television of the second invention, a waste of telephone charge can be prevented even if the user forgets about the connection of the telephone line to the Internet.

[0073]

According to this Internet television of the third invention, a waste of telephone charge can be prevented, even if the user forgets about the connection of the telephone line to the Internet.

[0074]

According to this Internet television of the fourth invention, a wast of telephone charge can be prevented even if the user

forgets about the connection of the telephone line to the Internet, because the user can be reminded of it.

[0075]

According to the Internet television of the fifth invention, the Internet screen can be automatically displayed in the entire display area when the television program is terminated in the state where the television broadcast and the Internet screen are displayed at the same time.

[0076]

According to the Internet television of the sixth invention, the Internet screen can be automatically displayed in the entire display area when the television program is terminated while displaying the television broadcast and the Internet screen simultaneously, and the user can be reminded of the termination of the program.

[Brief Description of the Drawings]

[FIG. 1] An explanatory diagram showing a connection example of an Internet television and the Internet.

[FIG. 2] A block diagram showing a constitution of an embodiment of an Internet television of the invention.

[FIG. 3] A block diagram showing a constitution of an Internet processing unit.

[FIG. 4] A block diagram showing a constitution of channel

selection microcomputer.

[FIG. 5] An explanatory diagram for explaining the operation of a DMA controller for transmitting a picture signal.

[FIG. 6] An explanatory diagram for explaining an initial screen of an Internet television of the invention.

[FIG. 7] An explanatory diagram for explaining a selection screen of "travel & sightseeing".

[FIG. 8] An explanatory diagram for explaining a state in which an ordinary television program is displayed in the left half of the display screen and an Internet screen is displayed in the right half of it.

[FIG. 9] A flowchart showing an operation relating to a display screen of a CPU after an Internet button is operated.

[FIG. 10] A flowchart showing an operation relating to a display screen of a CPU after an Internet button is operated.

[FIG. 11] A flowchart showing an operation relating to a display screen of a CPU after an Internet button is operated.

[FIG. 12] A flowchart for explaining an operation to be carried out when an ordinary television program and an Internet relating screen are respectively displayed.

[FIG. 13] A an explanatory diagram for explaining an example of caution/warning to be displayed on the screen.

[FIG. 14] A an explanatory diagram for explaining a menu

screen of a browser.

[FIG. 15] A an explanatory diagram for explaining an operation of a button in a menu screen of a browser.

[FIG. 16] A an explanatory diagram for explaining a menu screen of a browser.

[FIG. 17] A an explanatory diagram for explaining a character palette.

[FIG. 18] A an explanatory diagram for explaining a character palette.

[FIG. 19] A an explanatory diagram for explaining an example of connection between a computer and the Internet.

[Description of Reference Numerals]

- 1 Internet Television
- 17 CRT
- 18 TV Picture Horizontal Compression Unit
- 19 Picture Right And Left Composing Unit
- 20 Channel Selection Microcomputer
- 20a Remote Controller
- 22 Internet Processing Unit
- 24 Telephone Line (Communication Line)
- 25 Synchronizing Signal Generator
- 26 Clock Generator
- 27 Write Controller

28 Read Controller
29 Video FIFO
30 Interrupt Controller
37 RAM
38, 50 CPU
52 First Timer (First Clocking Means)
57 Second Timer (Second Clocking Means)

[Name of the Document] Abstract of the Disclosure

[Abstract]

[Purpose] The purpose of the Invention is to provide an Internet television capable of preventing a waste of telephone charge even if a telephone line is left in connection to the Internet.

[Means for Fulfilling the Purpose] An Internet television is made to be capable of displaying a picture signal in a video signal on a screen and taking in data from a computer connected to the Internet via a telephone line 24, converting it into a picture signal and display it on a screen 17, and capable of switching from a picture signal relating to the Internet which is displayed on the screen 17 to a picture signal in said video signal during the period when the television is in a waiting state for connection to the computer and/or is connected to the computer via the telephone line 24, comprising first clocking means (20) for clocking the time from connection to the computer via the telephone line 24 and time displaying means 21 for displaying the time clocked by the first clocking means (20) on the screen 17.

[Drawing to be Selected] FIG. 2

80 - 206223

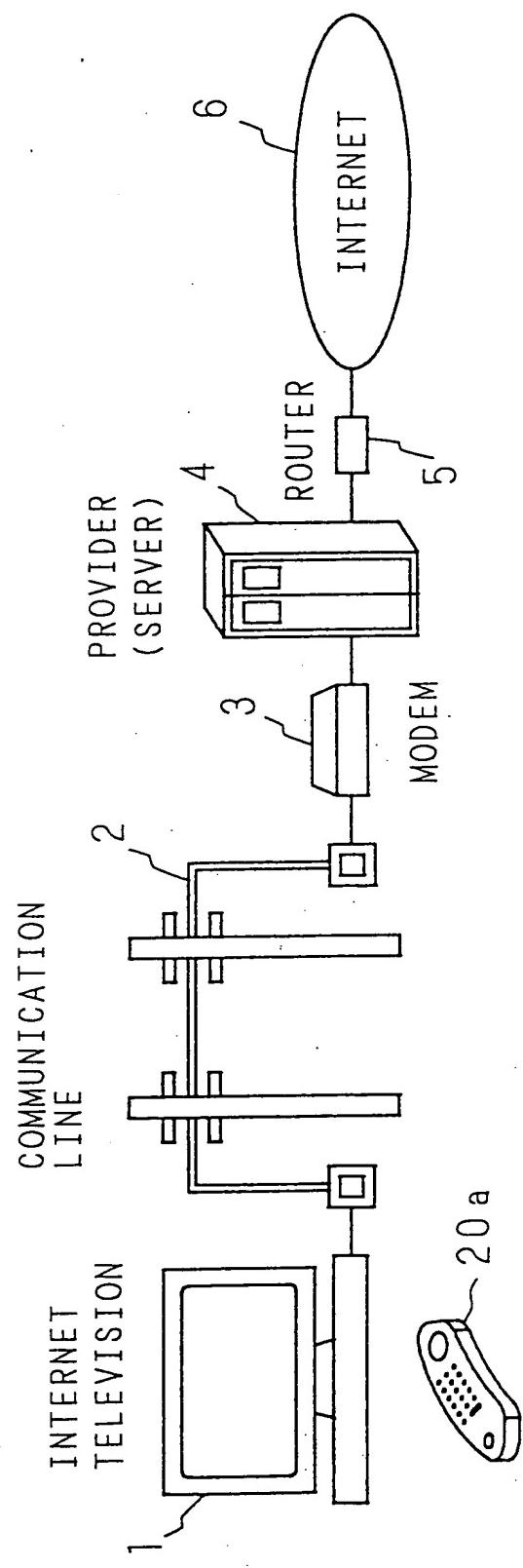
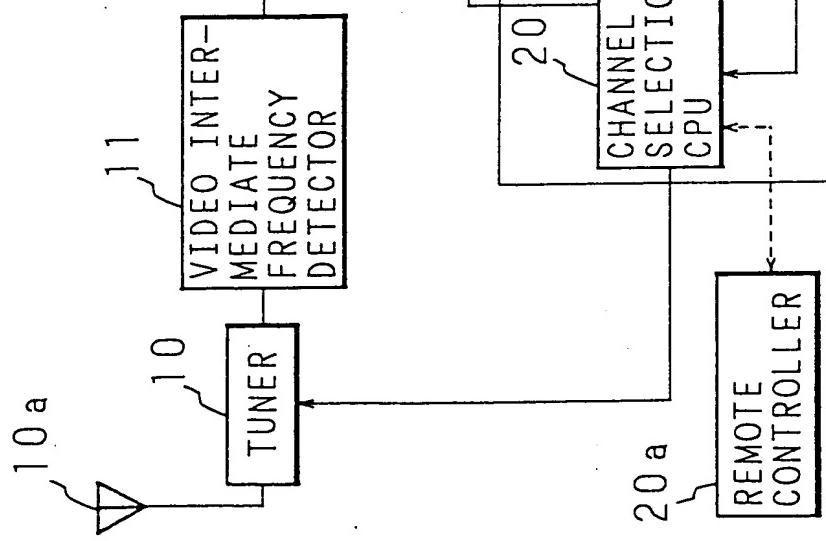


FIG. 1

FIG. 2



16

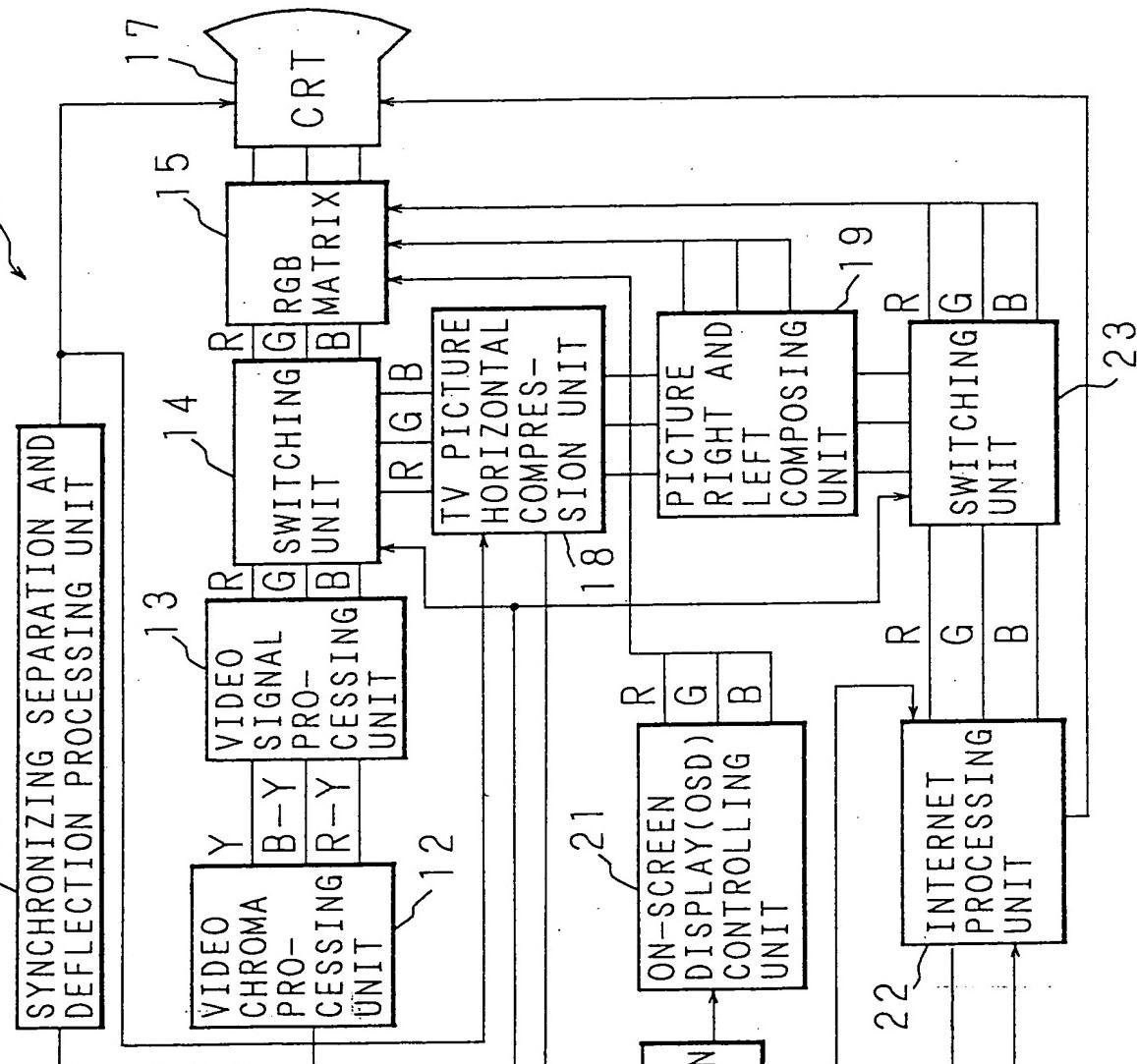


FIG. 3

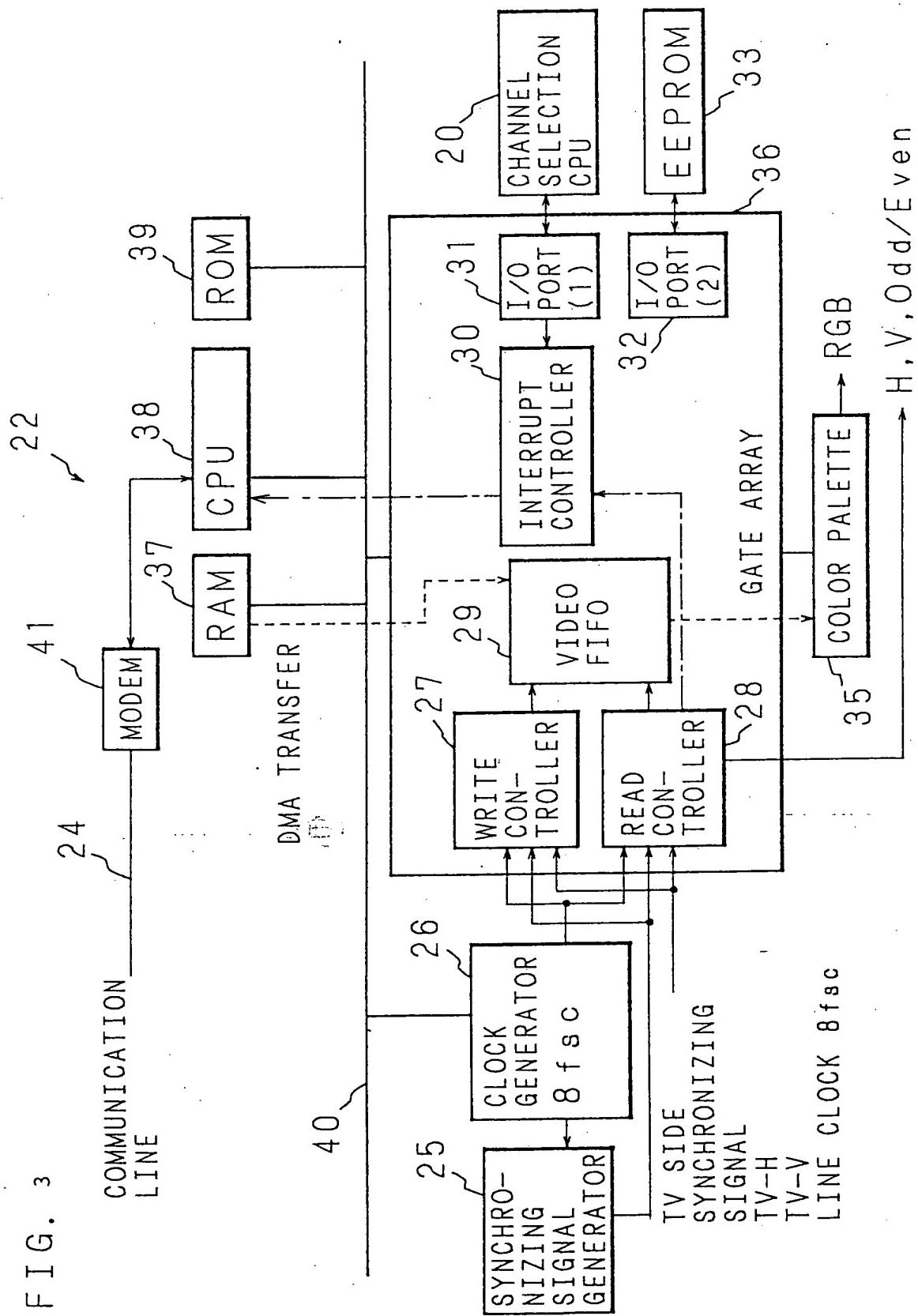


FIG. 4

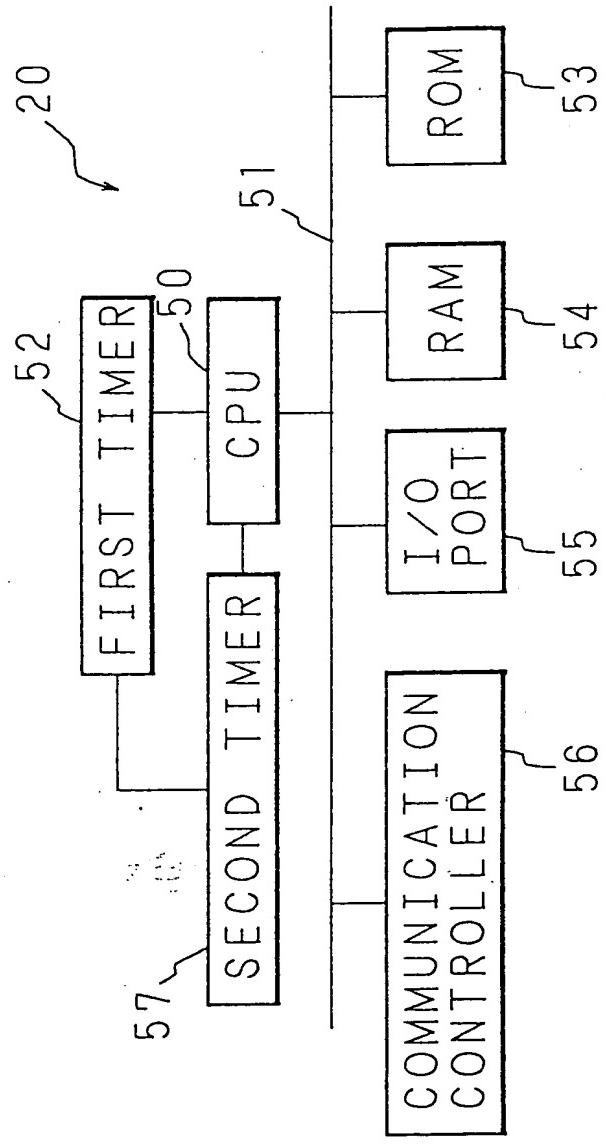


FIG. 5

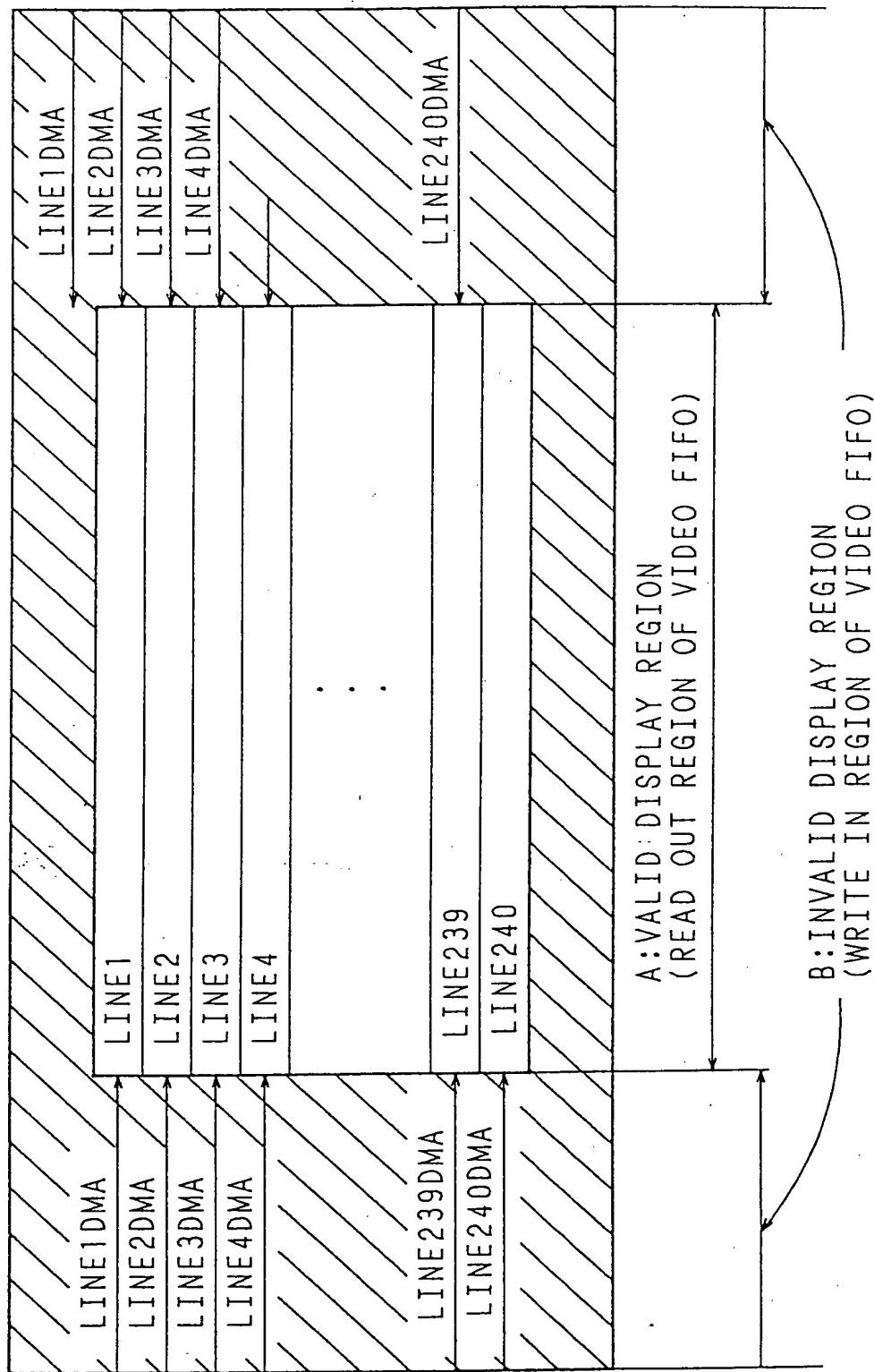


FIG. 6

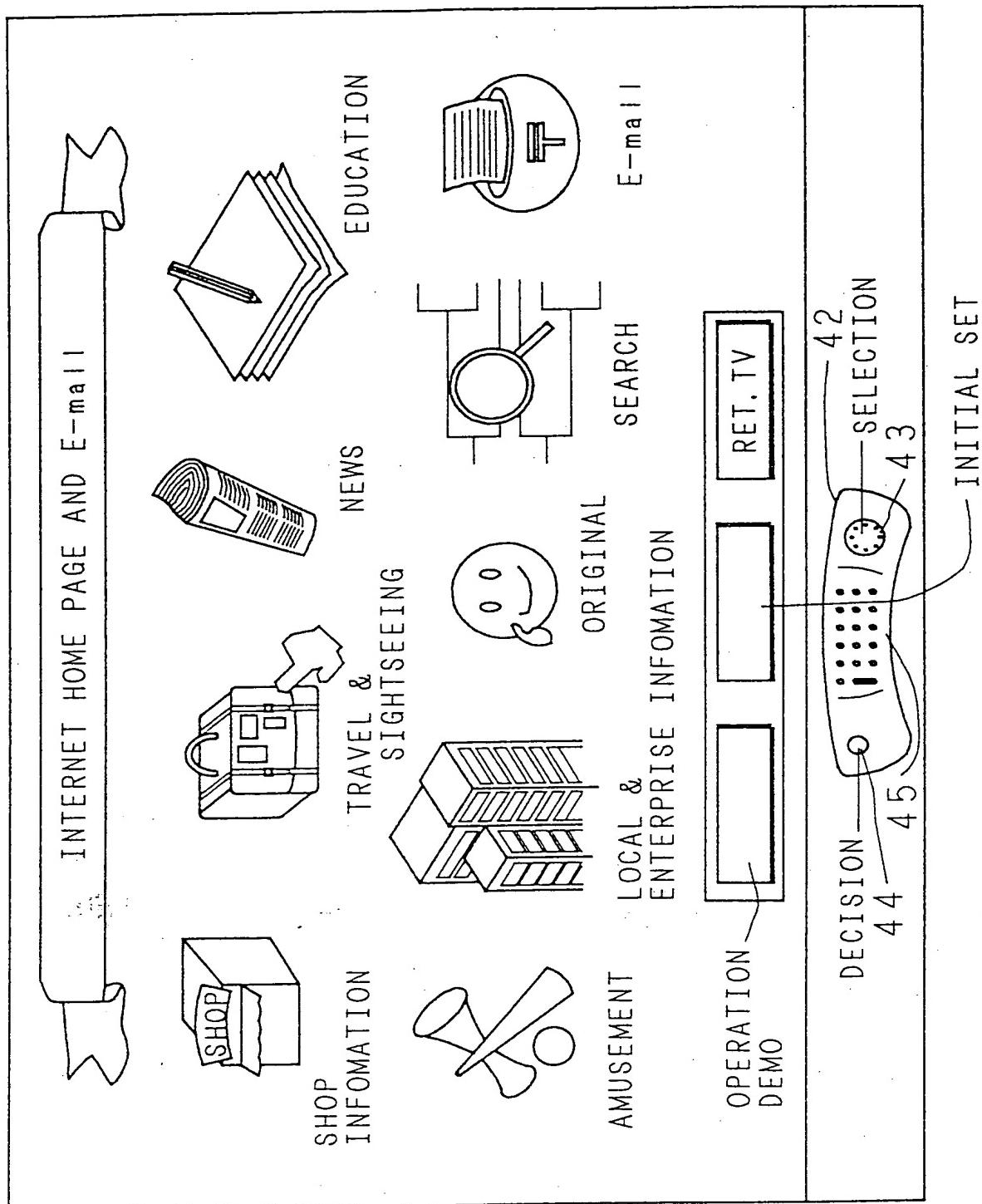


FIG. 7

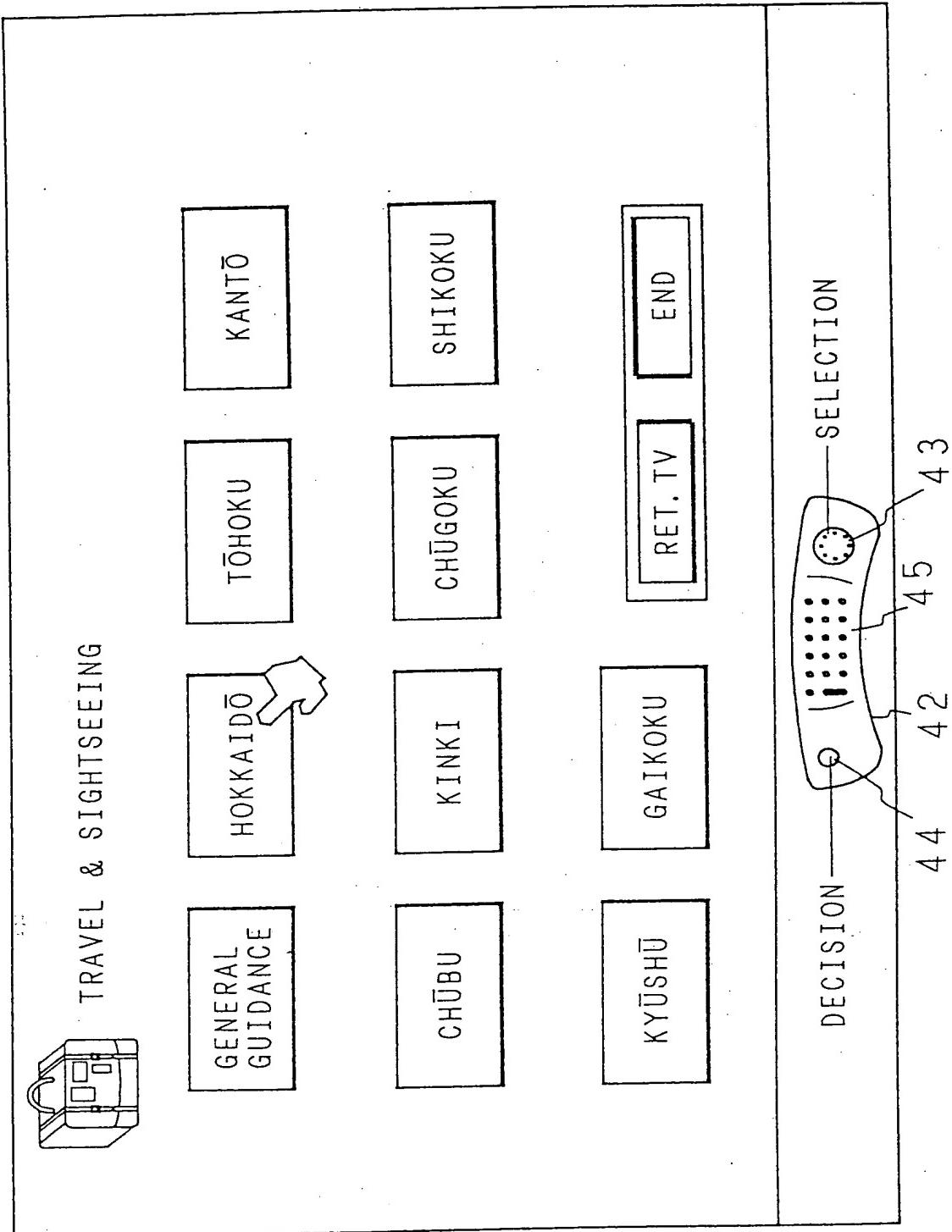


FIG. 8

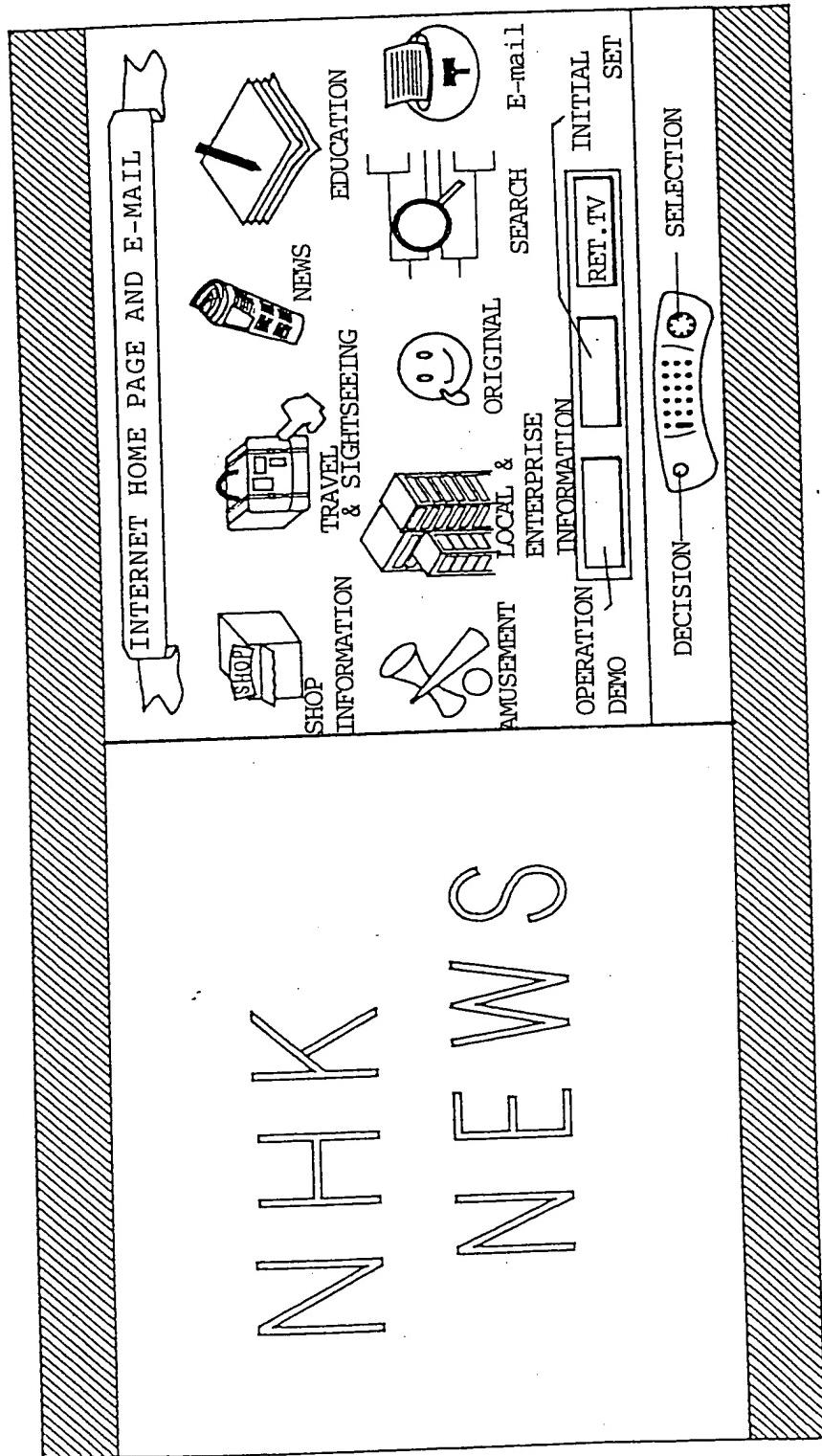


FIG. 9

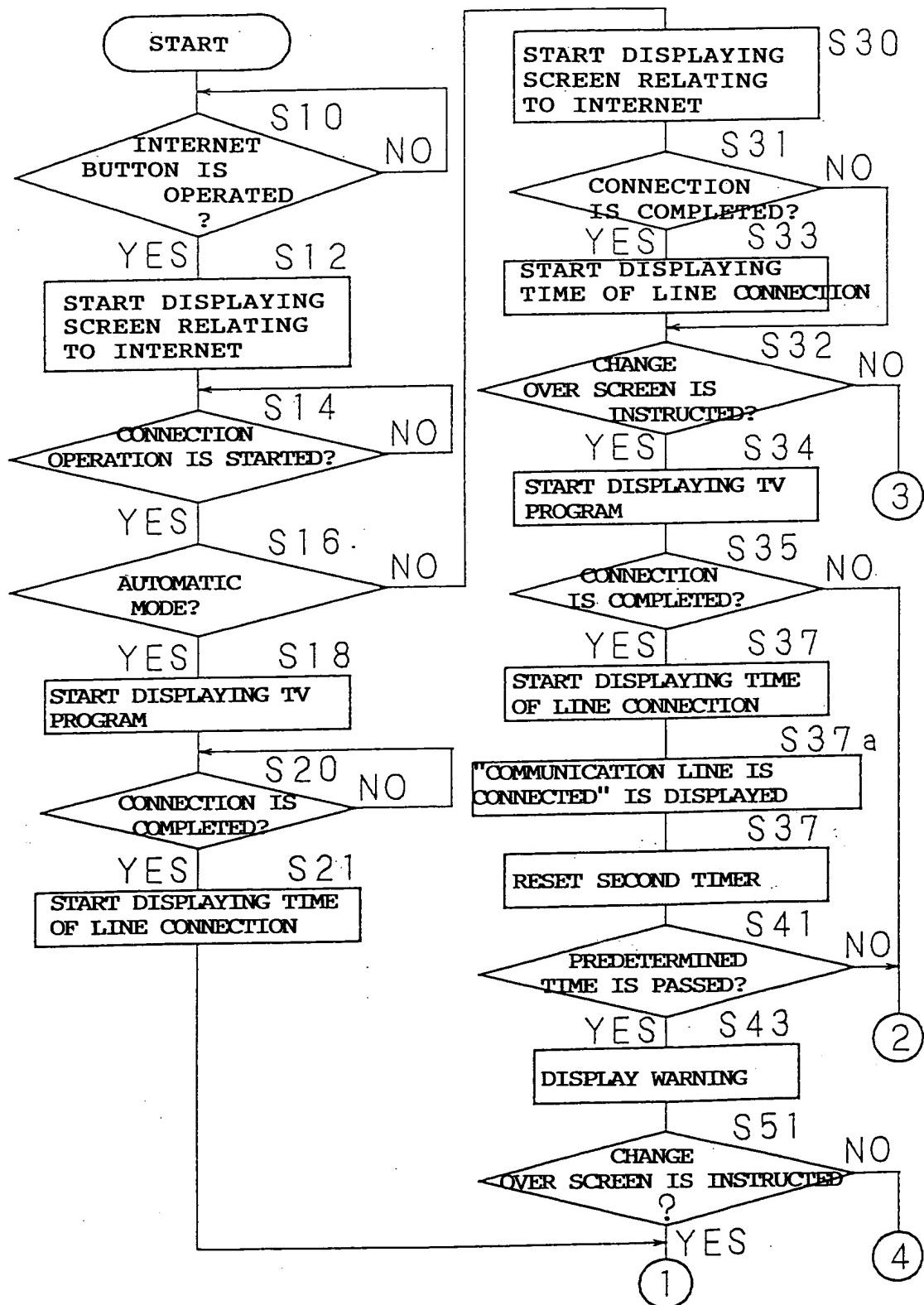


FIG. 10

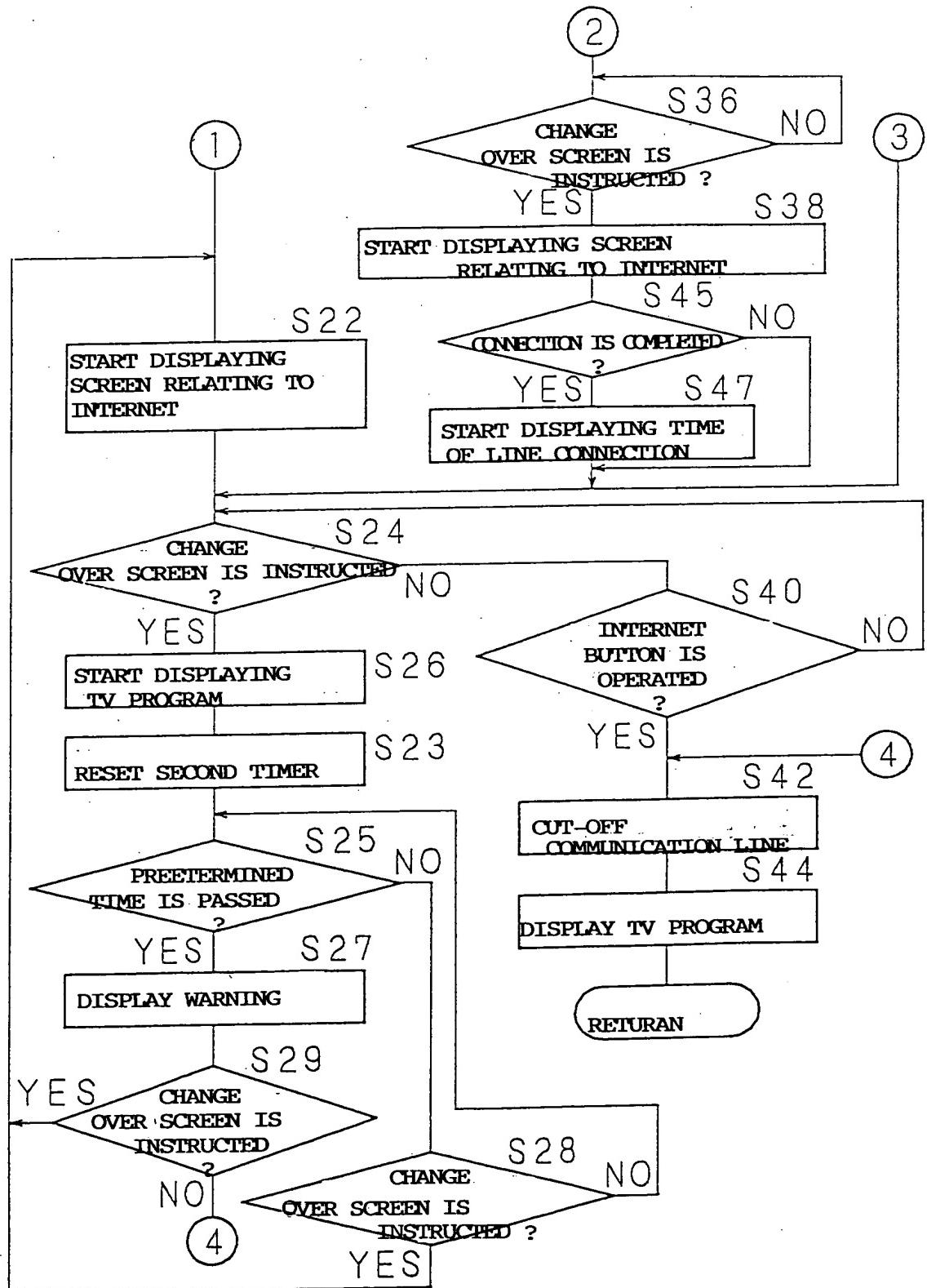


FIG. 11

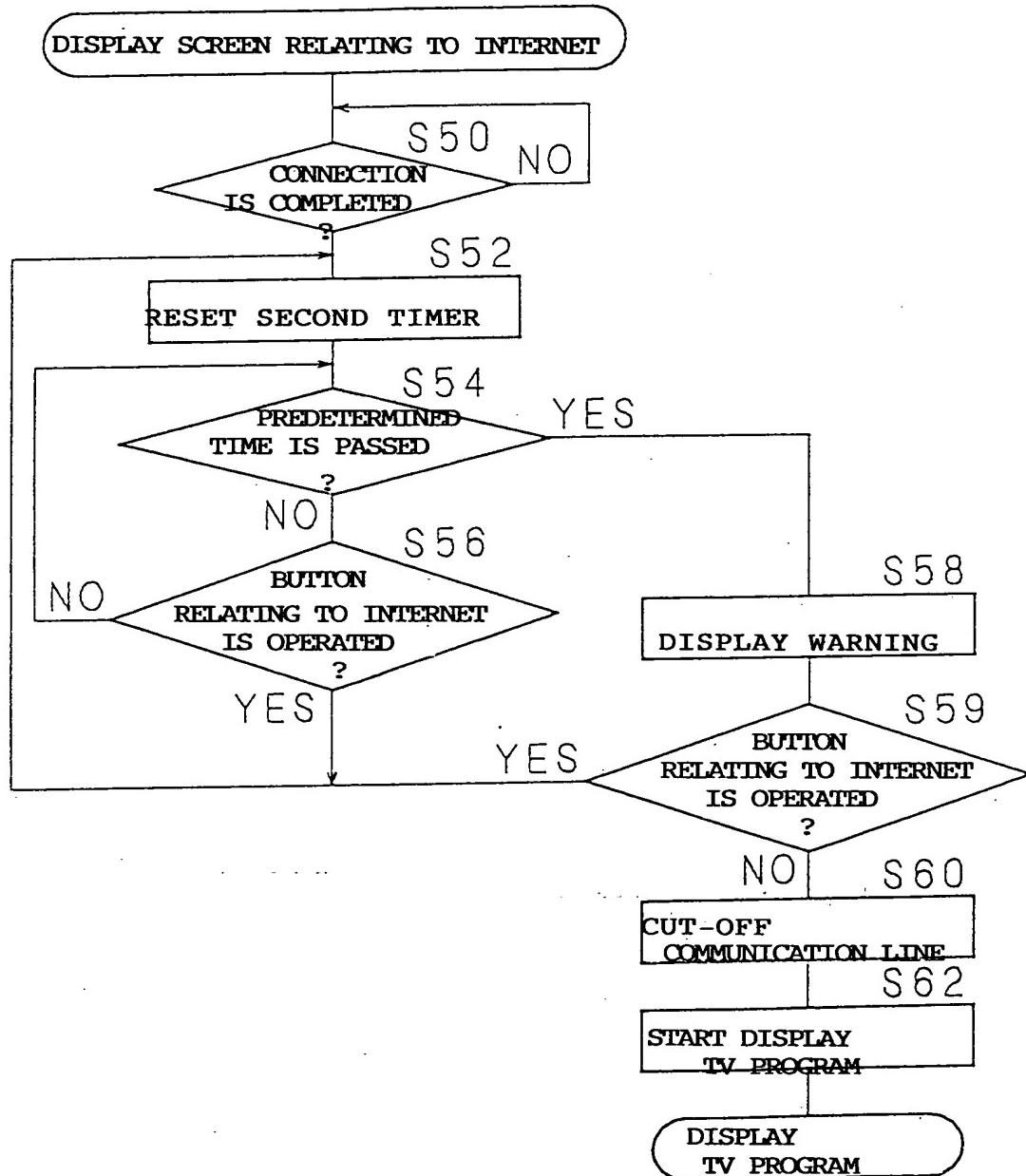


FIG. 12

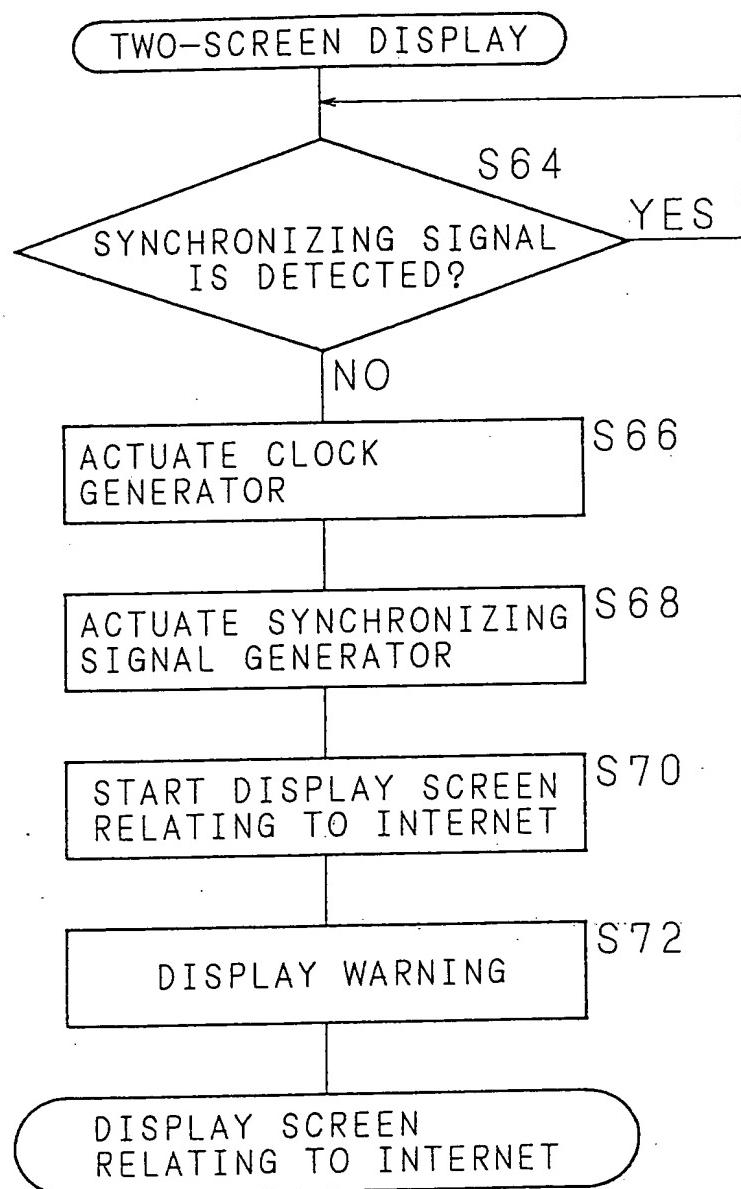
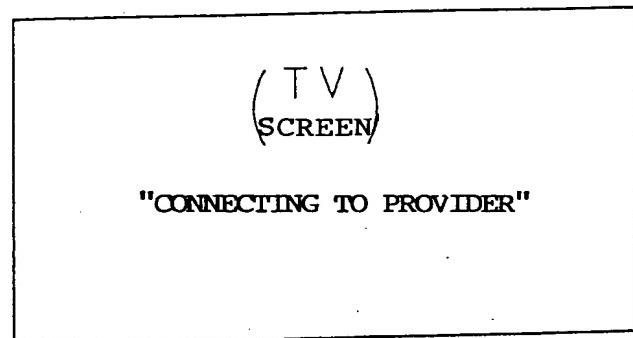
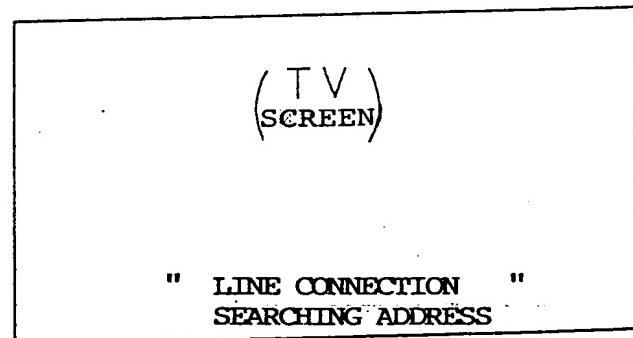


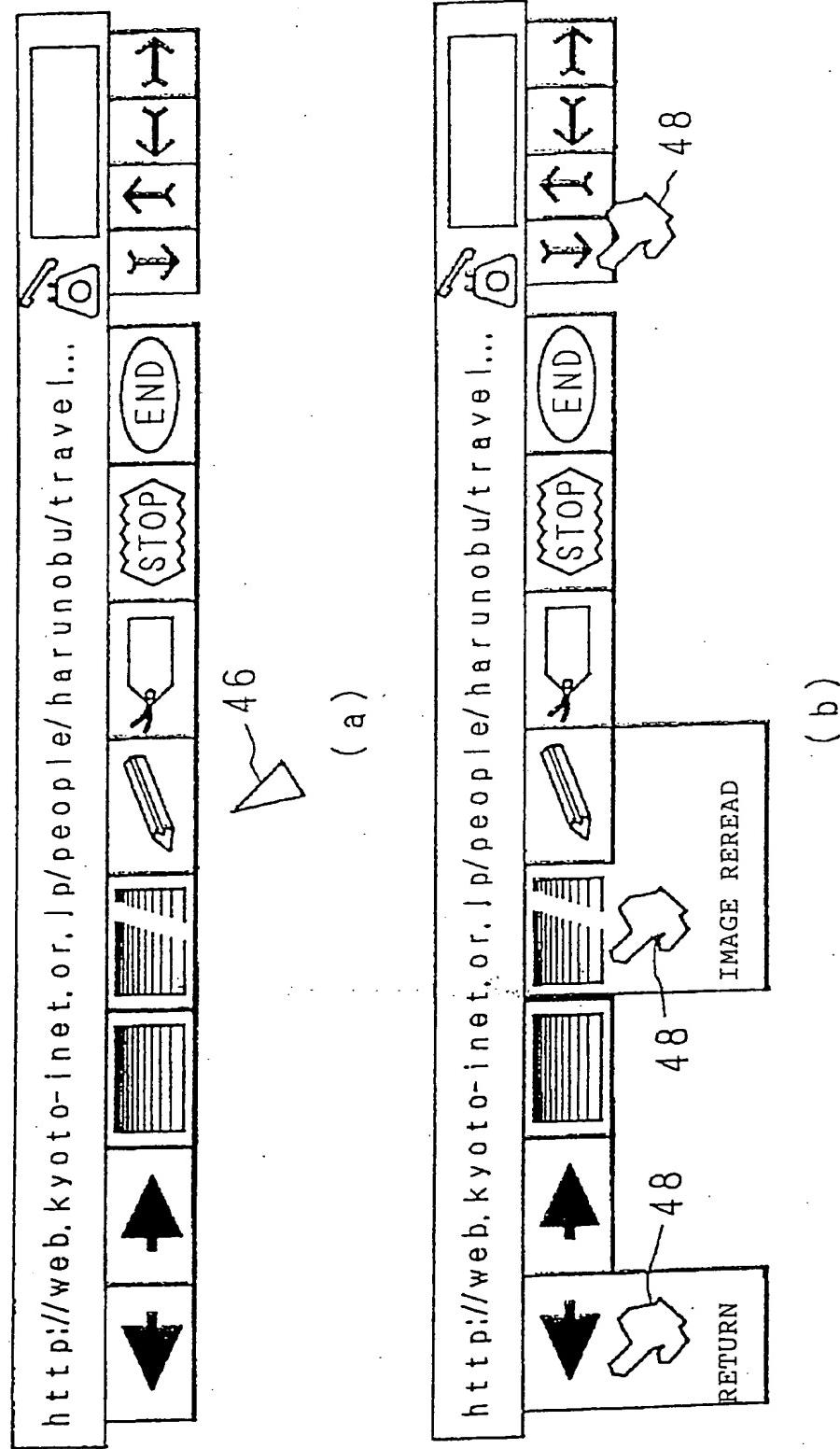
FIG. 13

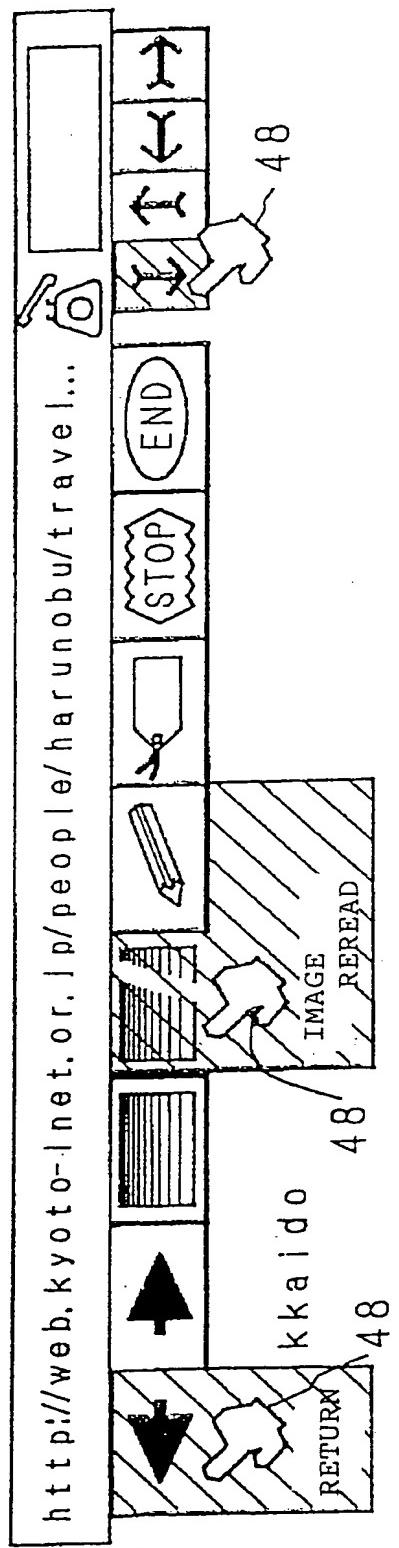


(a)

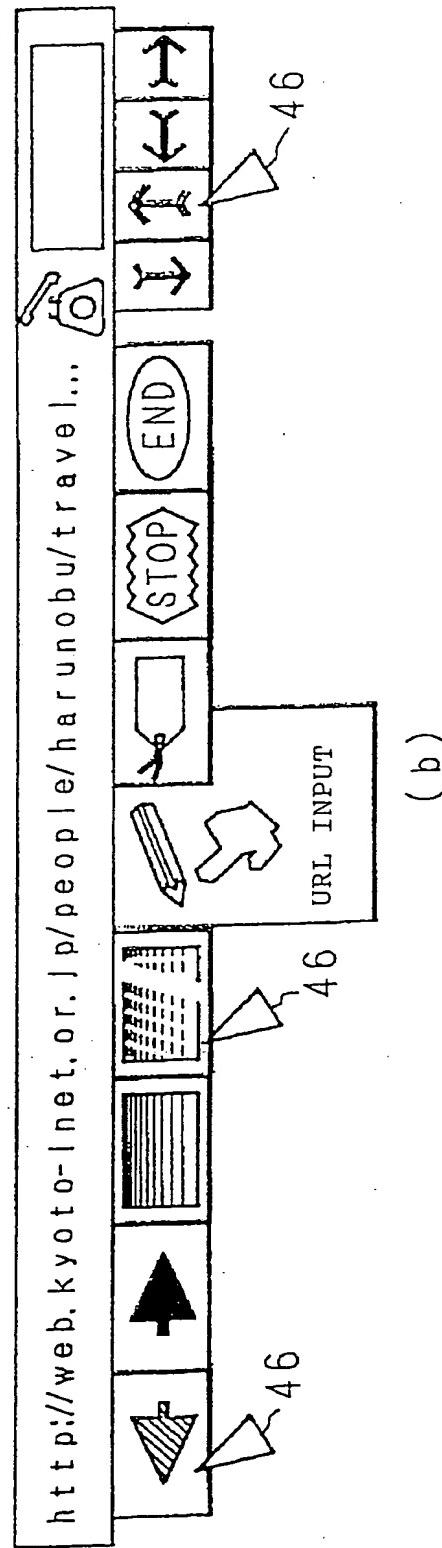


(b)





८



2

FIG. 16

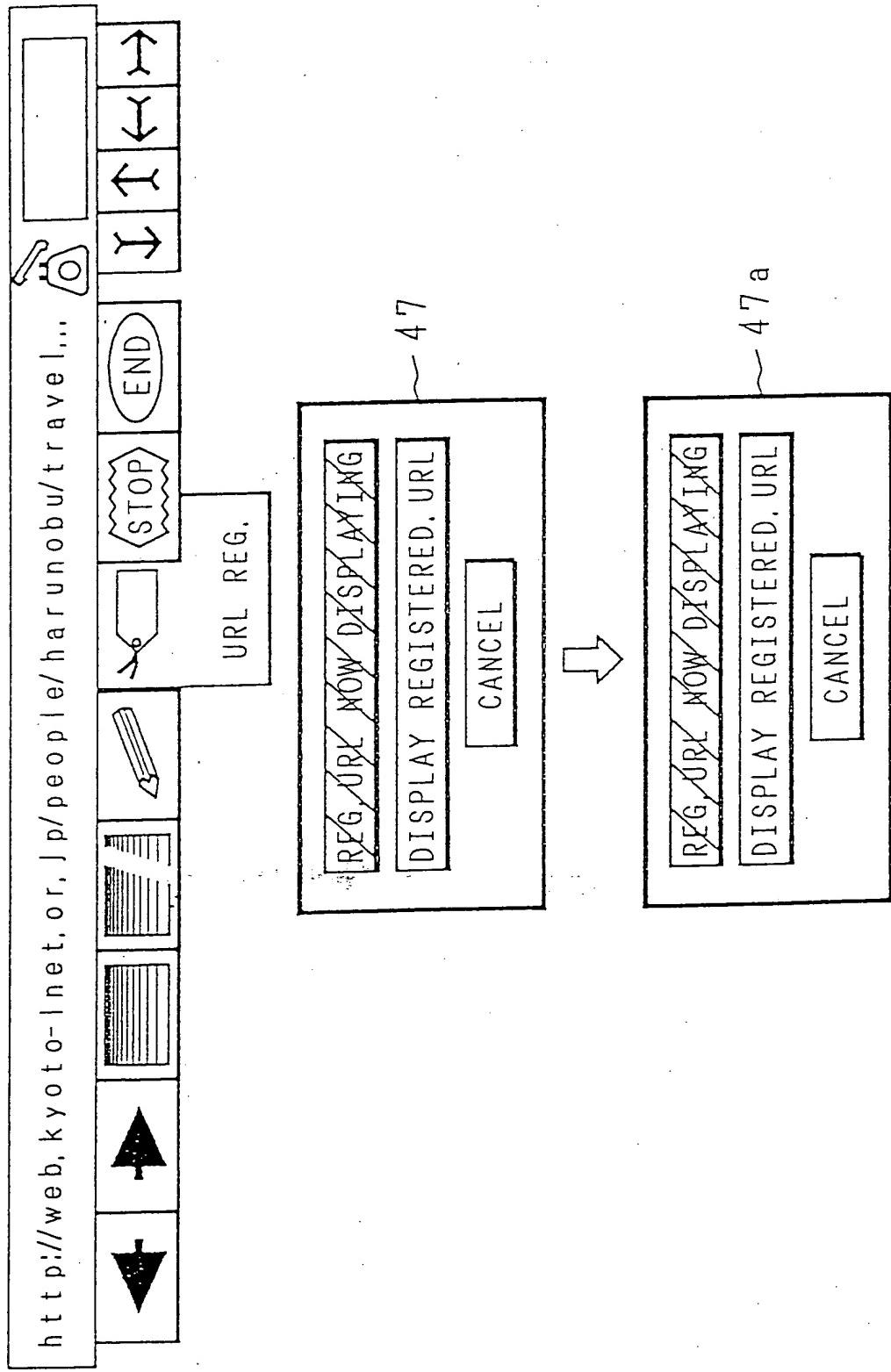


FIG. 17

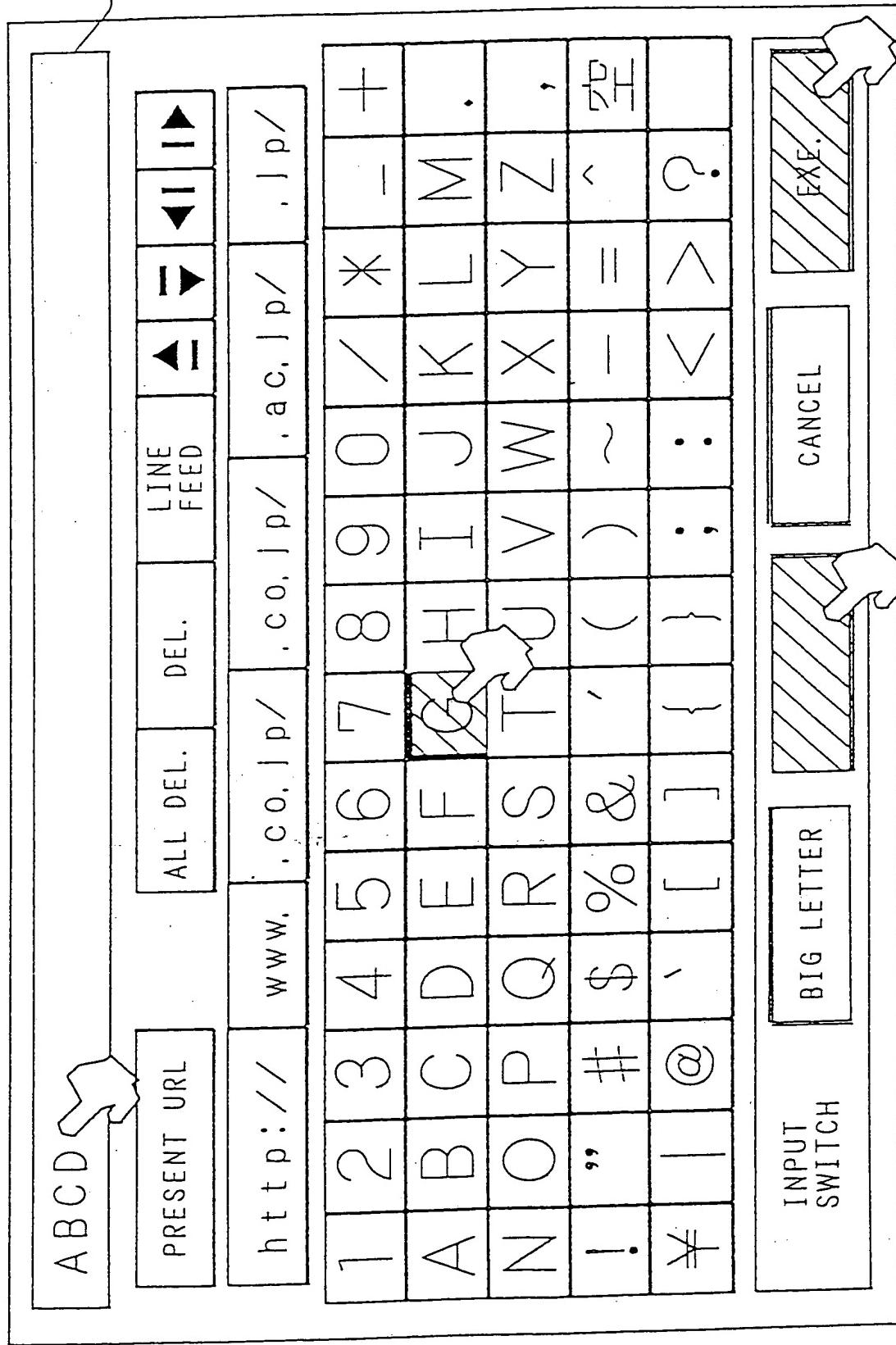
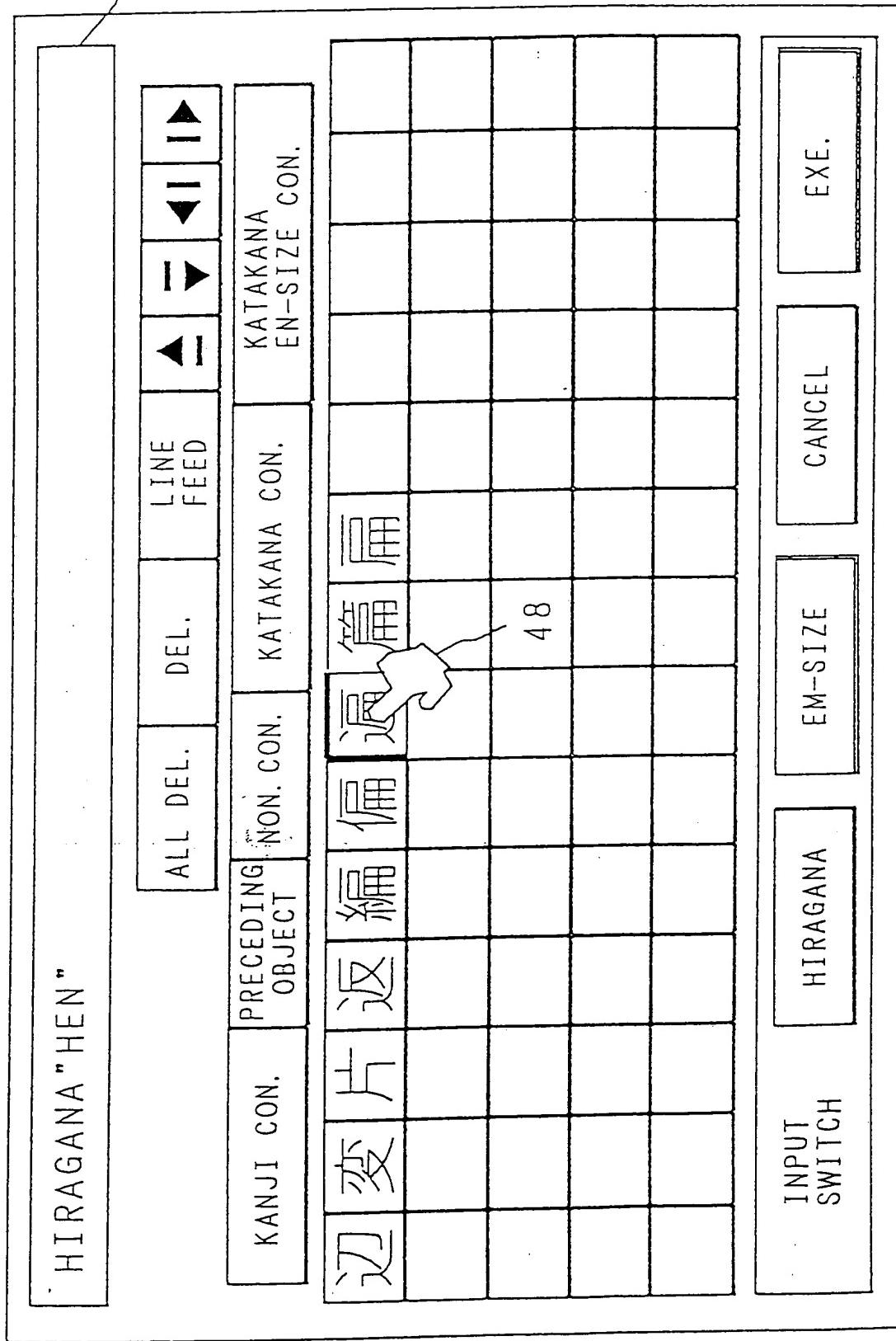


FIG. 18



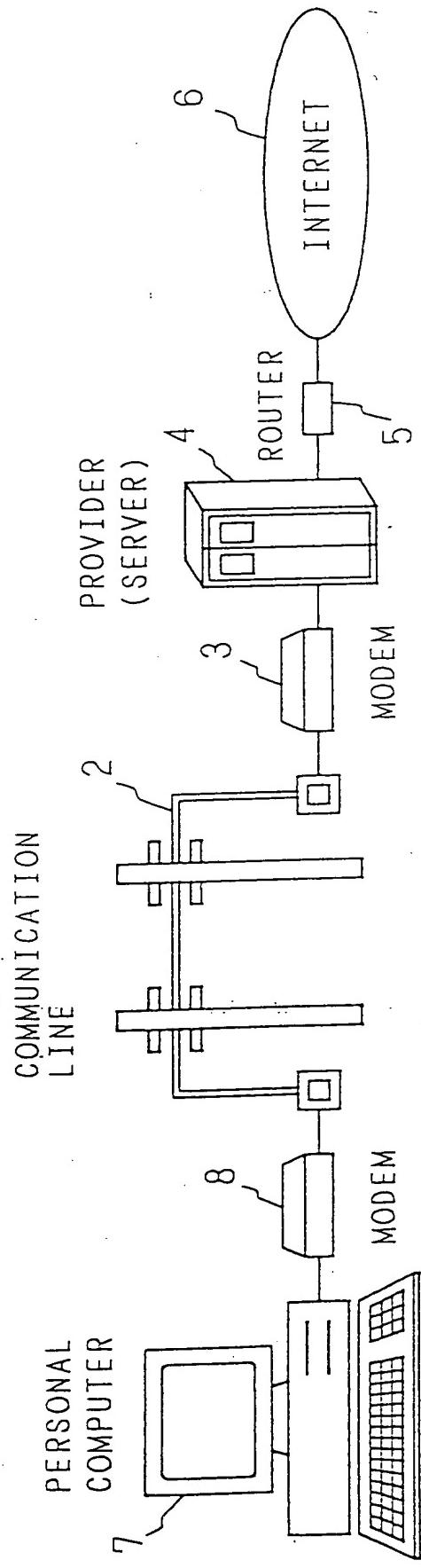


FIG. 19